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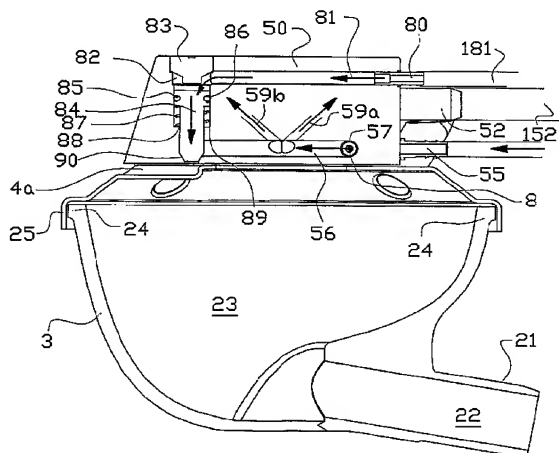
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MILKING CLAW DEVICE



(57) Abstract: Milking claw device for a milking device, provided with a milking claw housing (2) having a milk collection chamber and a number of connections (5a - d) for milk supply lines originating from teat cups and a connection (21) for a milk discharge line, wherein the milking claw housing has been provided with first connections (53a - d) for lines for supplying cleansing agent with pressurised fluid to the teat cups or milk lines connected thereto, with a second connection (55) for supplying cleansing agent with pressurised fluid to the first connections, as well as a passage system between the first and the second connections, comprising a first passage from the second connection, that branches into second passages to the second connections, wherein the passage system has been provided with at least one third passage, which forms a branch to a location of collection or discharge (92) wherein the passage system comprises a first valve (8) between the first and the second connections, for in closed position preventing that the cleansing agent with pressurised fluid is led through, wherein the third passage is situated downstream from the first valve.

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Milking claw device

BACKGROUND OF THE INVENTION

The invention relates to a milking claw device, provided with connections for allowing cleansing agent through to the teat cups.

5

Milking claw devices are generally known. They form a collection chamber for milk coming from the teats of a cow and are connected to a discharge line to a central milk storage. The milking claw device has been provided with four milk tubes on which teat cups have been arranged. Provisions for the usually pneumatic operation of the teat cups may have been arranged on the milking claw device. Provisions for supplying cleansing agent, such as iodine, and subsequently rinsing fluid, such as water and air, to the teat cups or to the connection thereof to the milk tubes in question, may have furthermore been arranged. Such an arrangement is known from WO 99/66787, WO 02/23976 and WO 2005/043986.

After milking a cow cleansing fluid or disinfectant is discharged to the teats in the teat cups. This may take place via a supply line which leads from a pressurised air source to an upper part of the milking claw housing and in the milking claw housing is connected via lines with four further lines leading to the teat cups. A discharge unit for iodine has been arranged on the pressurised air line. The supply line is usually kept closed by a valve in the upper part of the milking claw housing. When the discharge of cleansing agent to the teat cups is wanted, the valve is opened so that the iodine-containing pressurised air is able to flow via the further lines to the teat cups and the teats. The valve is

subsequently closed again and the teat cups can be removed from the teats. The teat cups can then be rinsed.

It may occur that the valve in the upper part of the milking claw housing fails, and then remains in a fully or partially opened position. The result is that the iodine-containing air flow is kept intact, and iodine is continued to be discharged to the teat cups. This may continue during rinsing, which is not objectionable but for the waste of iodine. More objectionable is that the flow of iodine-containing air also continues during the next milking course. The in that case – inadvertently- discharged iodine then ends up in the milk coming from the teats and is thus passed via milk tubes to the collection chamber into the milking claw housing and from there to the central milk storage. Large quantities of milk may thus get contaminated by iodine.

15

SUMMARY OF THE INVENTION

It is an object of the invention to improve on this.

It is an object of the invention to provide a device of the type mentioned in the preamble, with which iodine can be prevented from ending up in an unwanted manner and at unwanted moments in the teat cups or the milk lines connected thereto. At least one of these objects is according to the invention achieved with a milking claw device for a milking device, provided with a milking claw housing having a milk collection chamber and a number of connections for milk supply lines originating from teat cups and a connection for a milk discharge line, wherein the milking claw housing has been provided with first connections for lines for supplying cleansing agent with pressurised fluid to the teat cups or milk lines connected thereto, with a second connection for supplying cleansing agent with pressurised fluid to the first connections, as well as a passage system between the first and second connections, comprising a first passage from the second connection, that branches into second passages to the second connections, wherein the passage system has been provided with at least one third passage, which forms a branch to a location of collection or discharge, wherein the passage system comprises a first valve between the first and second connections, for in closed position

preventing that the cleansing agent with pressurised fluid is led through, wherein the third passage is situated downstream from the first valve.

- 5 When the first valve inadvertently cannot be fully brought back to a closed position following the discharge of the cleansing agent, the cleansing agent with pressurised fluid flowing along the first valve will be able to deflect through the third passage and not through the second connections to the teat cups or milk lines connected thereto.

10

In a simple embodiment the first valve has been arranged for closing off the first passage.

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The deflection of the cleansing agent-containing fluid is enhanced when the third passage ends freely in the atmosphere. The fluid will follow the path of least resistance, not via the lines to the teat cups which lines have usually been provided with a non-return valve that has a threshold pressure.

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In an as regards structure simple embodiment, the second passages and the third passage connect to the first passage at a communal location, wherein the third passage preferably is in line with the first passage.

25

In a further development of the milking claw device according to the invention it has been provided with a second valve for closing off the third passage. In that way the third passage can be closed off for the period that the discharge of the cleansing agent-containing fluid is indeed wanted. The effect of the second valve is enhanced when the second valve is biased to a position that keeps the third passage open.

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For operating the second valve the milking claw device may have been provided with a third connection for a pressurised fluid to a fourth passage for by means of pressurised fluid operating the second valve.

35

In one embodiment the second valve comprises a pin with a free end for closing off the third passage, wherein the pin is movable between a closed-off position and an opening position in a direction transverse or diagonal to the first and/or third passage.

Discharging the cleansing agent-containing fluid is enhanced when the third passage has been placed for during use being horizontal or oriented so as to slope down in flow direction.

5

In a compact embodiment the said connections and passages are housed in an upper part of the milking claw housing. When the upper part is removably attached to the milking claw housing, it may, as a component part, replace an existing standard upper part of a milking
10 claw housing and thus cost-effectively add the provision according to the invention thereto.

In one embodiment the upper part has an upper wall and a side wall sloping down diagonally or transversely therefrom, wherein the second
15 valve is accessible via a cap in the downwardly sloping side wall. The diagonally sloping side wall may be less susceptible to the collection and accumulation of falling dirt than the upper wall is, as a result of which the cap can remain accessible and passable, for instance to clean the second valve internally.

20

From a further aspect the invention provides such an upper part for a milking claw housing according to the invention.

From a further aspect the invention provides a milking claw device
25 according to the invention, provided with teat cups and milk tubes that form the connection between the first connections and the teat cups.

From a further aspect the invention provides a milking installation provided with a number of milking claw devices according to the
30 invention and a central milk storage connected to the milk discharge lines thereof.

The aspects and measures described in this description and claims of the application and/or shown in the drawings of this application may
35 where possible also be used individually. Said individual aspects and other aspects may be the subject of divisional patent applications relating thereto. This particularly applies to the measures and aspects that have been described per se in the sub claims.

SHORT DESCRIPTION OF THE DRAWINGS

The invention will be elucidated below on the basis of an exemplary
5 embodiment shown in the attached drawings, in which:

Figure 1 shows a view of an exemplary embodiment of a milking claw
device according to the invention;

10 Figure 2 shows a schematic, partial cross-section of the upper part of
the milking claw device of figure 1;

Figure 3 shows the milking claw device of figures 1 and 2, in a first
stage of use;

15

Figure 4 shows the milking claw device of figures 1 and 2, in a next
stage of use; and

20

Figure 5 shows a schematic partial cross-section of an alternative upper
part for the milking claw device of figure 1, having an adjusted interior.

DETAILED DESCRIPTION OF THE DRAWINGS

The milking claw device 1 according to a first embodiment as shown in
25 figures 1-4 comprises a milking claw housing 2, having an inside 23
defined by a bowl-shaped wall 3 provided with an upper circumferential
edge 24, and a lid 4 provided with a pending circumferential edge 25
placed airtight on the upper edge of the bowl 3. A spout 21 has been
integrally formed in the bottom area of the bowl 3, which spout defines
30 a passage 22. A schematically shown milk discharge line 121 can be
connected to the spout 21.

The lid 4 has been provided with four spouts 5a-d forming passages
20a-d to the inside 23 of the milking claw housing 2, and to which the
35 milk tubes 105a-d schematically shown in figure 1 can be connected.
Said milk tubes 105a-d have been connected to teat cups that have not
been shown and receive the milk therefrom.

By means of screws 60 an upper part 50 is detachably attached to the lid 4, which part 50 with the lid 4 can form a replaceable unit, which may for instance replace a conventional lid unit placed on the bowl 3.

- 5 The upper part 50 substantially serves as connection and passage of several operation lines and operation fluid, respectively. In this example spouts 51a-d for vacuum lines 151a-d to the teat cups can be seen, in order to move the liners of the teat cups, in a manner known per se for milking. Inside the upper part 50, the spouts 51a-d are in connection
10 with a spout 52 to which a vacuum/air line 152 has been connected, leading to a vacuum source that is not shown.

- Immediately below the spouts 51a-d the upper part has been provided with spouts 53a-d, to which tubes 153a-d have been connected leading
15 to the teat cups in question or parts of the milk tubes 105a-d connecting thereto, in order to allow cleansing agent with pressurised air and/or water/pressurised air mixture to be passed thereto. Inside the upper part 50, the spouts 53a-d are in connection with a passage 56 via four upwardly inclined ducts 59a-d, which passage 56 is in line with
20 a spout 54, to which a tube 154 is connected that is in connection with a water/air source that is not shown.

- The upper part 50 has also been provided with a spout 55 for connection to a source of pressurised air with cleansing agent, such as
25 iodine, via line 155, wherein the spout 55 internally via a transverse passage 57 in the upper part 50 is in connection with the passage 56 and thus with the ducts 59a-d and thus (also) with the spouts 53a-d. As shown in figure 2, the transverse passage 57 can be closed off by a valve 8, that is automatically operated with means that are not further
30 shown in/at the milking claw.

The connections discussed up until now are known from the state of the art.

- 35 According to the invention the upper part 50 has furthermore been provided with a spout 80 for connection of a tube 180 leading to a source for pressurised air. In the upper part 50 the spout 80 is in connection with a passage 81 leading to a vertical chamber 82 that is

closed off by means of a screw cap 83. Against the bottom side of the screw cap 83 the head 85 of a pin 84 supports, which pin has a bevelled lower end 90. The head 85 of the pin 84 has a sealing ring 86 against the wall of the chamber 82. More or less halfway the pin 84 the chamber has been provided with a shoulder 89 against which compression spring 88 supports, which at the other end supports against shoulder 87 of the head 85.

In this example the passage 56, after the branchings 59a-d, has been extended with a passage section 56a, which in use is horizontal or slopes down, and ends up in a lowermost area of a vertical chamber 82, which lowermost area downwardly changes into an inclined circumferential edge or valve seat 91, matching the bevelled lower end 90 of the pin 84. Via passage 92, the lowermost area of the chamber 82 is in connection with the atmosphere, via lowered section 4a of the lid 4.

When operational the milking claw device 1 of the preceding figures may be used as follows.

During milking the milking claw device 1 hangs below the cow's udder, and the milk tubes 105a-d are connected to the teats of the cow's udder via teat cups that are not shown. Via the lines 152 the tubes 151a-d are alternately put under pressure/at a vacuum, so that a milking motion is carried out in the teat cups. The milk discharged as a result thereof flows via the milk tubes 105a-d, the spouts 5a-d into the inside 23 of the milking claw housing 2, and is discharged via the spout 21, via the milk discharge line 121 to a central storage.

When the milking course with the cow in question can be stopped, the tube 152 is no longer activated. Pressurised air with a cleansing agent, such as iodine, is indeed discharged to the teats and optionally the inside of the teat cups via the tube 155, the spout 55, the passages 57, 56, ducts 59a-d, spouts 53a-d and tubes 153a-d.

Prior to supplying cleansing agent, such as iodine, via line 155, transverse passage 57, passage 56, etcetera, to the teat cups, the line 181 is activated, as a result of which pressurised air exerts pressure on

- passage 81, and on chamber 82, on the head 85 of the pin 84. As a result, counter the action of the compression spring 88, the pin 84 is urged down to have the lower end 90 engage into the seat 91 in a liquid-proof manner. In that way the passage 56a is closed off in an airtight/liquid-proof manner. Subsequently the cleansing agent including pressurised air is supplied via the tube 155, after opening the valve 8. The pressurised cleansing fluid goes to the teat cups via the passages 59a-d, the spouts 53a-d, the tubes 153a-d, and is discharged in the teat cups via a non-return valve having a threshold pressure of for instance 1.5 bars. This is schematically shown in figure 3 in which for reasons of clarity the spout 54/line 154 have been left out. Subsequently the valve 8 is closed off, and rinsing via tube 154, spout 54, passage 56, etcetera, can start.
- 15 If the valve 8 for whatever reason is not (fully) closed, cleansing agent will continue to be supplied via the line 155. This will go on in all next process steps, until in a next milking course the supply of cleansing agent is wanted, and the valve 8 is operated to be opened again. For that period, in order to prevent cleansing agent from continuing to flow to the teat cups and/or the milk tubes 105a-d and continuously being discharged therein due to exceeding the threshold pressure, the pressure line 180 is deactivated, as a result of which the pin 84 under the influence of the compression spring 88 is able to move upwards, wherein the lower end 90 comes out of the seat 91, and a fluid connection is created between passage section 56a and passage 92. The cleansing agent originating from the line 155 can then flow freely away via passage 56, 56a, through the opening 92, via recess 4a, to the outside air, see figure 4.
- 30 Figure 5 shows an alternative interior for the upper part 50. The screw cap 83 is in that case attached in the side wall 68 of the upper part 50, which side wall slopes down diagonally. The horizontal passage 81 is connected via a vertical continuance 81a to a chamber 82' oriented diagonally downward from the screw cap 83. The pin 84 with the bevelled lower end 90 rests against the bottom side of the screw cap 83. Because the screw cap 83 has been accommodated in the side wall 68 that slopes down, dirt will be less inclined to adhere to the screw

cap 83, as a result of which it remains accessible and passable at all times for instance to clean the pin 84.

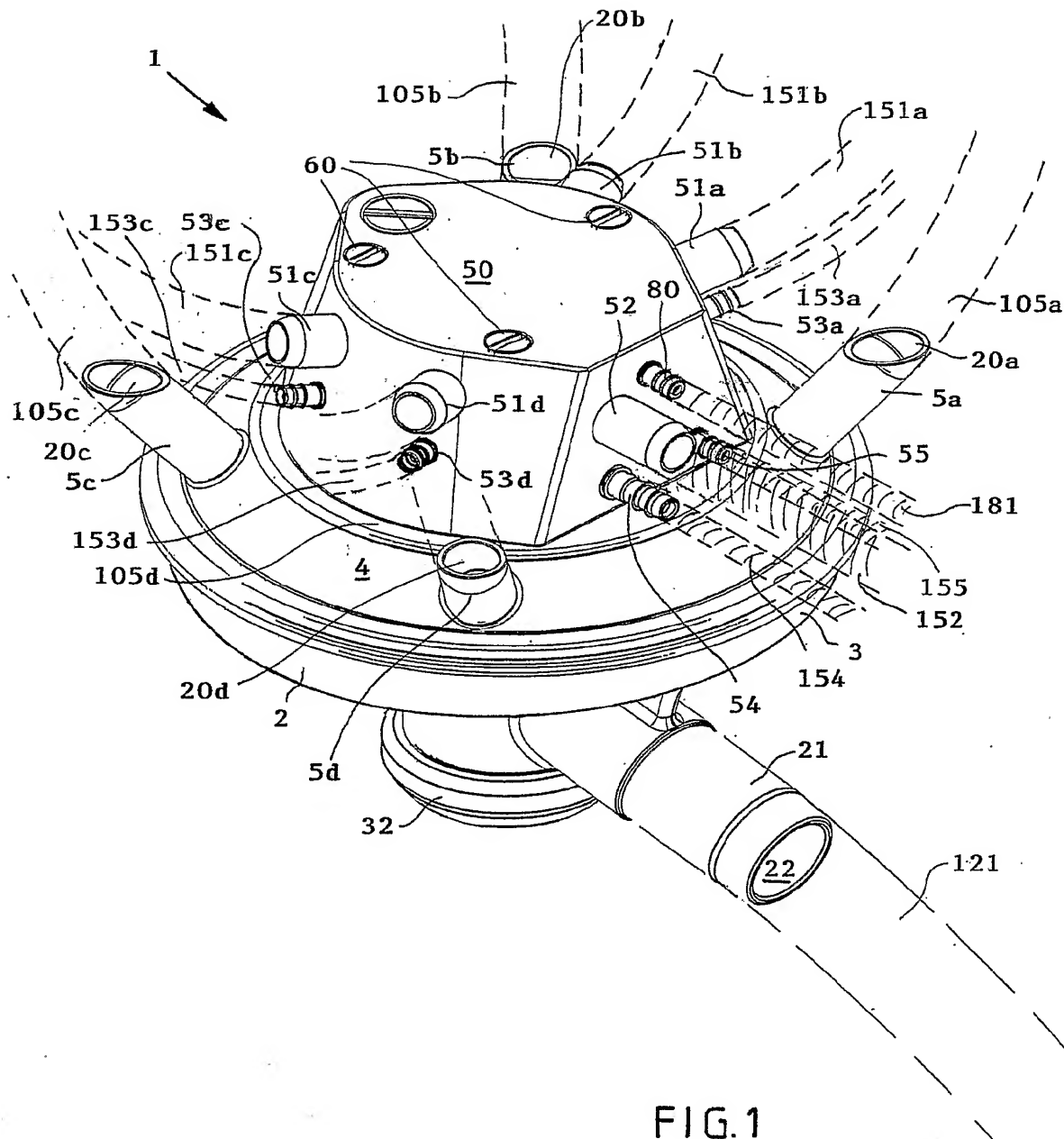
5 Via passage 92', the lowermost area of the chamber 82' is in connection with the atmosphere, via the recessed section 4a of the lid 4. Via valve seat 91', the lowermost area of the chamber 82' is in connection with horizontal passage section 56a. Because of supply of pressurised air via the line 181 and the spout 80 the pin is urged downwards to have the lower end 90 engage in the seat 91'. In the
10 position shown the cleansing agent originating from the line 155 is able to flow away through the passage 92', via recess 4a, to the outside air.

Claims

1. Milking claw device for a milking device, provided with a milking claw housing having a milk collection chamber and a number of connections for milk supply lines originating from teat cups and a connection for a milk discharge line, wherein the milking claw housing
5 has been provided with first connections for lines for supplying cleansing agent with pressurised fluid to the teat cups or milk lines connected thereto, with a second connection for supplying cleansing agent with pressurised fluid to the first connections, as well as a passage system between the first and second connections, comprising
10 a first passage from the second connection, that branches into second passages to the second connections, wherein the passage system has been provided with at least one third passage, which forms a branch to a location of collection or discharge, wherein the passage system comprises a first valve between the first and second connections, for in
15 closed position preventing that the cleansing agent with pressurised fluid is led through, wherein the third passage is situated downstream from the first valve.
2. Milking claw device according to claim 1, wherein the first valve has
20 been arranged for closing off the first passage.
3. Milking claw device according to claim 1 or 2, wherein the third passage ends freely in the atmosphere.
- 25 4. Milking claw device according to claim 1, 2 or 3, wherein the second passages and the third passage connect to the first passage at a communal location, wherein the third passage preferably is in line with the first passage.

5. Milking claw device according to any one of the claims 1-4, provided with a second valve for closing off the third passage.
- 5 6. Milking claw device according to claim 5, wherein the second valve is biased to a position that keeps the third passage open.
7. Milking claw device according to claim 5 or 6, provided with a third connection for a pressurised fluid to a fourth passage for by means of
10 pressurised fluid operating the second valve.
8. Milking claw device according to any one of the claims 5-7, wherein the second valve comprises a pin with a free end for closing off the third passage, wherein the pin is movable between a closed-off position
15 and an opening position in a direction transverse or diagonal to the first and/or third passage.
9. Milking claw device according to any one of the preceding claims, wherein the third passage has been placed for during use being
20 horizontal or oriented so as to slope down in flow direction.
10. Milking claw device according to any one of the preceding claims, wherein the said connections and passages are housed in an upper part of the milking claw housing.
- 25 11. Milking claw device according to claim 10, wherein the upper part is removably attached to the milking claw housing.
12. Milking claw device according to claim 10 or 11, when depending
30 on claim 5, wherein the upper part has an upper wall and a side wall sloping down diagonally or transversely therefrom, wherein the second valve is accessible via a cap in the downwardly sloping side wall.
13. Upper part to be placed on a milking claw housing according to
35 claim 11 or 12.

14. Milking claw device according to any one of the preceding claims, provided with teat cups and milk tubes that form the connection between the first connections and the teat cups.
- 5 15. Milking installation provided with a number of milking claw devices according to any one of the preceding claims and a central milk storage connected to the milk discharge lines thereof.
- 10 16. Device provided with one or more of the characterising measures described in the attached description and/or shown in the attached drawings.



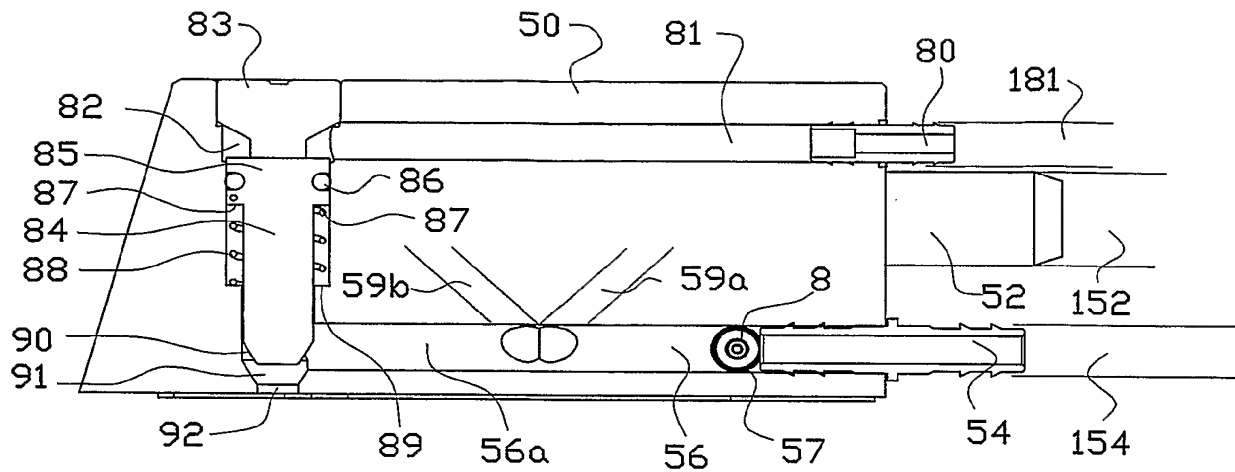


FIG. 2

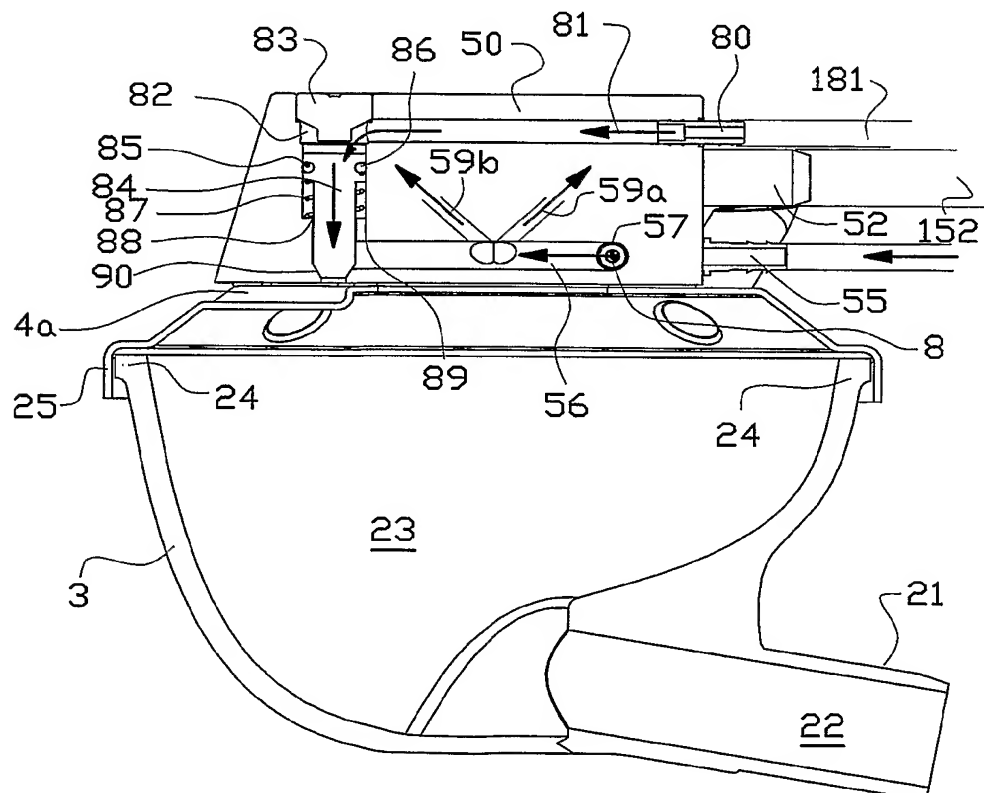


FIG. 3

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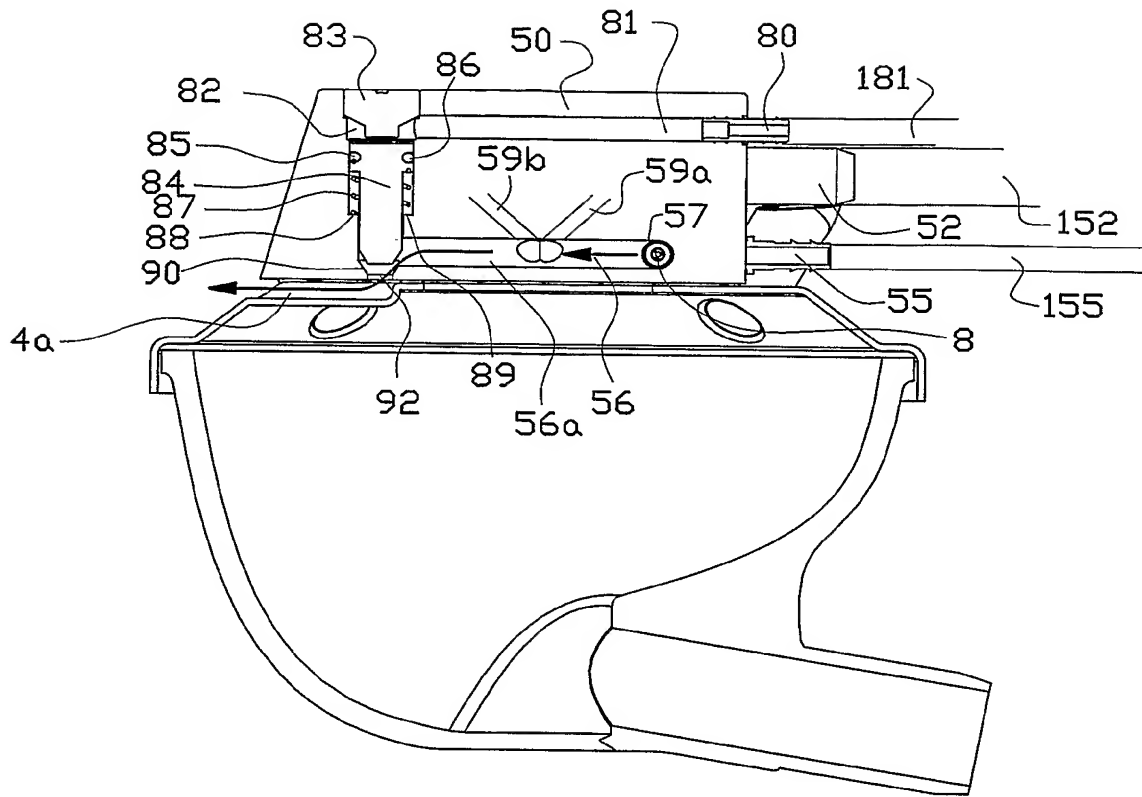


FIG. 4

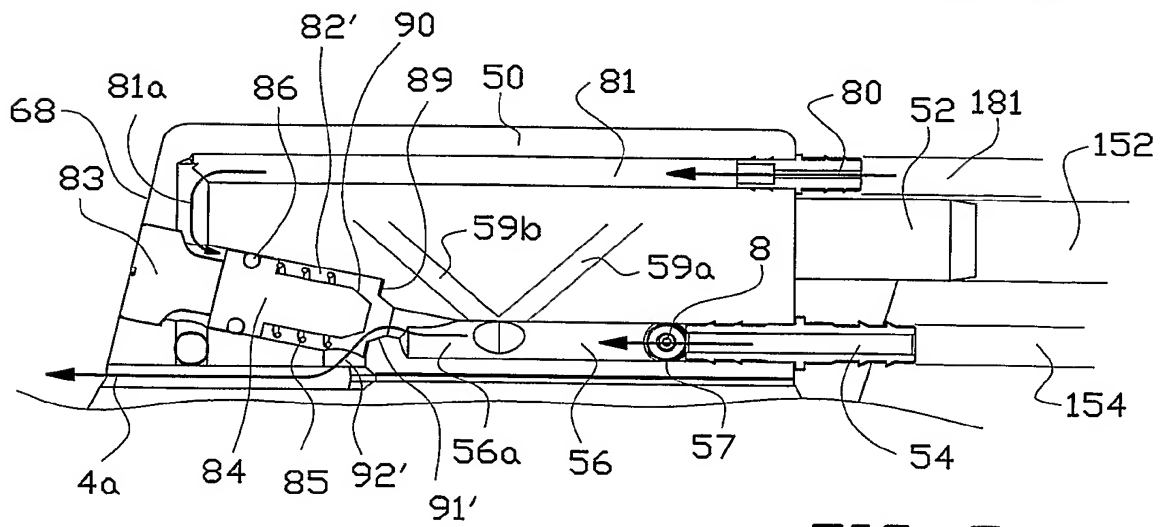


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2007/000118

A. CLASSIFICATION OF SUBJECT MATTER
INV. A01J5/04 A01J7/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 191 076 A (SEABORNE THOMAS LESLIE) . 9 December 1987 (1987-12-09) figures 1-10	1,13
A	WO 99/66787 A (RIEBERJO B V [NL]; DIETRICH BERHOLD JOHANNES THEO [NL]) 29 December 1999 (1999-12-29) cited in the application the whole document	1
A	WO 02/23976 A (RIEBERJO B V [NL]; DIETRICH BERTHOLD JOHANNES THEO [NL]) 28 March 2002 (2002-03-28) cited in the application the whole document	1
	-/--	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

3 August 2007

Date of mailing of the international search report

10/08/2007

Name and mailing address of the ISA/

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Authorized officer

Moeremans, Benoit

INTERNATIONAL SEARCH REPORT

International application No

PCT/NL2007/000118

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2005/043986 A (DUKE JAMES RICHARD JOHN [GB]) 19 May 2005 (2005-05-19) cited in the application the whole document -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NL2007/000118

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 16
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 16

Claim 16 is unclear (Article 6 PCT) because it relies on references to the drawings and to the description (see Rule 6.2(a) PCT).

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/NL2007/000118

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